IR Speed Dome

Installation Manual

V2.0.1

Hikvision® IR Speed Dome User's Manual

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Regulatory Information

FCC Information

FCC compliance: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

EU Conformity Statement

This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC.

2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info.

Description on Laser Specification

The optical disc drive such as DVD Super Multi (Double Layer) Drive 22X that is used in this computer is equipped with laser. The classification label with the following sentence is affixed to the surface of the drive.

CLASS 1 LASER
PRODUCT TO IEC60825-1
LASER KLASSE 1

The drive with the above label is certified by the manufacturer that the drive complies with the requirement for laser product on the date of manufacturing pursuant to article 21 of Code of Federal Regulations by the United States of America, Department of Health & Human Services, Food and Drug Administration.
In other countries, the drive is certified to comply with the requirement pursuant to IEC 60825-1 and EN 60825-1 on class 1 laser product.
This computer is equipped with the optical disc drive in the following list according to the model.

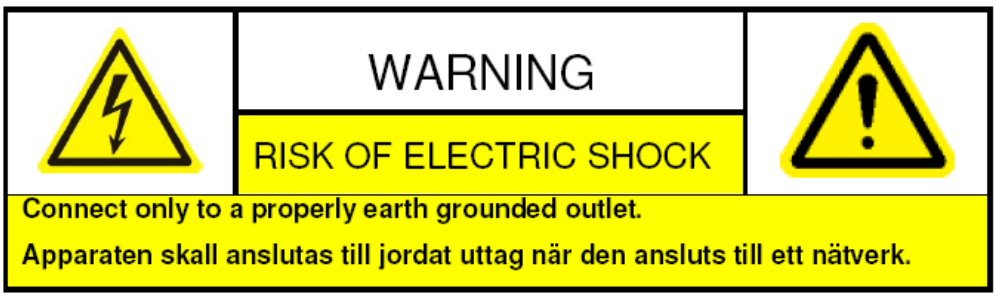
Safety Warnings and Cautions

Please pay attention to the following warnings and cautions:

Hazardous Voltage may be present: Special measures and precautions must be taken when using this device. Some potentials (voltages) on the device may present a hazard to the user. This device should only be used by employees from our company with knowledge and training in working with these types of devices that contain live circuits.

Caution
The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified personel.

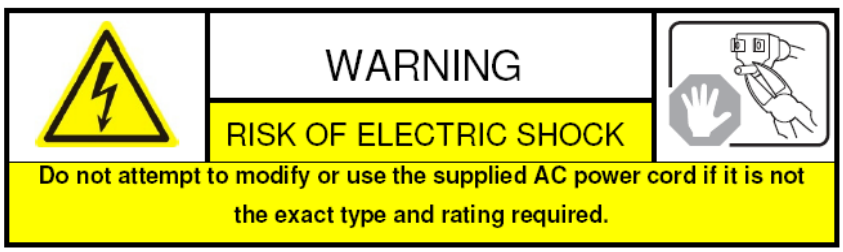
Power Supply Hazardous Voltage: AC mains voltages are present within the power supply assembly. This device must be connected to a UL approved, completely enclosed power supply, of the proper rated voltage and current. **No user serviceable parts inside the power supply.**


WARNING
RISK OF ELECTRIC SHOCK
Connect only to a properly earth grounded outlet.
Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk.

System Grounding (Earthing): To avoid shock, ensure that all AC wiring is not exposed and that the earth grounding is maintained. Ensure that any equipment to which this device will be attached is also connected to properly wired grounded receptacles and are approved medical devices.

Power Connect and Disconnect: The AC power supply cord is the main disconnect device to mains (AC power).The socket outlet shall be installed near the equipment and shall be readily accessible.

Installation and Maintenance: Do not connect/disconnect any cables to or perform installation/maintenance on this device during an electrical storm.


WARNING
RISK OF ELECTRIC SHOCK
Do not attempt to modify or use the supplied AC power cord if it is not the exact type and rating required.

Power Cord Requirements: The connector that plugs into the wall outlet must be a grounding-type male plug designed for use

in your region. It must have certification marks showing certification by an agency in your region. The connector that plugs into the AC receptacle on the power supply must be an IEC 320, sheet C13, female connector. See the following website for more information http://kropla.com/electric2.htm.

Lithium Battery: This device contains a Lithium Battery. There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the vendor's instructions and in accordance with local environmental regulations.

Perchlorate Material: Special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate. This notice is required by California Code of Regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials. This device includes a battery which contains perchlorate material.

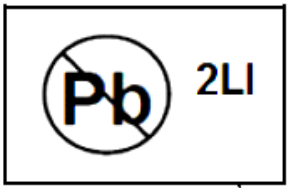
Taiwan battery recycling:

Please recycle batteries.

Thermal and Mechanical Injury: Some components such as heat sinks, power regulators, and processors may be hot; care should be taken to avoid contact with these components.

Electro Magnetic Interference: This equipment has not been tested for compliance with emissions limits of FCC and similar international regulations. This device is not, and may not be, offered for sale or lease, or sold, or leased until authorization from the United States FCC or its equivalent in other countries has been obtained. Use of this equipment in a residential location is prohibited. This equipment generates, uses and can radiate radio frequency energy which may result in harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is required to take measures to eliminate the interference or discontinue the use of this equipment.

Lead Content:



Please recycle this device in a responsible manner. Refer to local environmental regulations for proper recycling; do not dispose of device in unsorted municipal waste.

Preventive and Cautionary Tips

Before connecting and operating this product, please be advised of the following tips:

- All the operations should strictly comply with the local electrical safety regulations, fire prevention regulations and other related regulations.
- Ensure unit is properly secured. Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.
- Power down the unit before connecting and disconnecting accessories and peripherals.
- Make sure that the endure ability of ceilings or walls is 4 times as the weight of speed dome and its accessories.

1. Preparation of cables
   - Choose the video cable according to the transmission length. The video should meet the least demands as:
     1. 75Ω resistance
     2. 100% copper core conducting wire.
     3. 95% weaving copper shield.
   - RS485 communication cable, please refer to Appendix 2
   - 24V AC power cable, please refer to Appendix 3
2. Please keep all wrappers

   Please keep all wrappers after unpack them for future use. In case of any failure occurred, please return the speed dome to the factory with the original wrapper.

   Note: Transportation without the original wrapper may result in damage on the speed dome and cost additional charge.

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Chapter 1 Installation and Settings

The following installation instructions are applicable to Hikvision IR speed domes, network IR speed domes and network high-definition IR speed domes. Wall mounting is chosen as an example in this chapter. Please refer to Chapter 3 for different types of mountings.

Note: Before installation, please make sure that the device in the package is in good condition and all the assembly parts are complete.

Before you start:

1. For cement walls, expansion screws are needed for dome mounting. For wooden walls, you need to mount the base with self-tapping screws. Please make sure that the wall is sturdy enough to withstand more than 3 times of the weight of the dome and the bracket. If not, the dome may fall and cause serious damage.
2. Please keep the wrappers after unpack the product. In case of any failure occurred, please return the speed dome to the dealer with the original wrapper.

Note: Transportation without the original wrapper may result in damage to the speed dome and extra cost.

1.1 Installation

Steps:

1. Position the mount to the wall and fasten the lock screws to secure it.

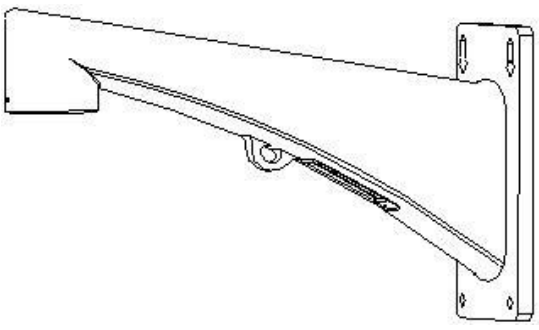


Figure1. 1 Wall Mount

2. Screw the fast-mounting adapter to the wall mount and tighten it. Fasten the set screw to reinforce as shown in Figure 1.2

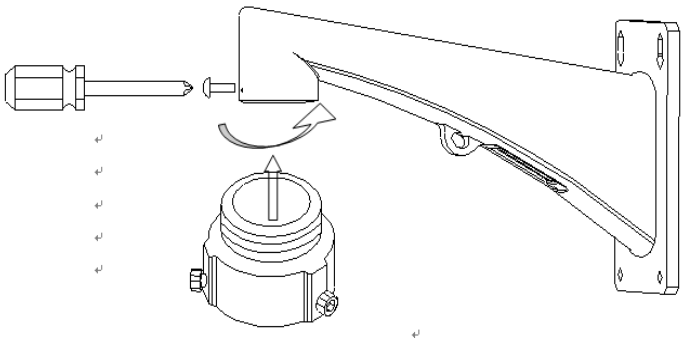


Figure1. 2 Fasten the fast-mounting Adapter

3. Loosen both of the lock screws on the fast-mounting adapter, screw the top cover to the adapter and fasten the lock screws with the L-shaped wrench.

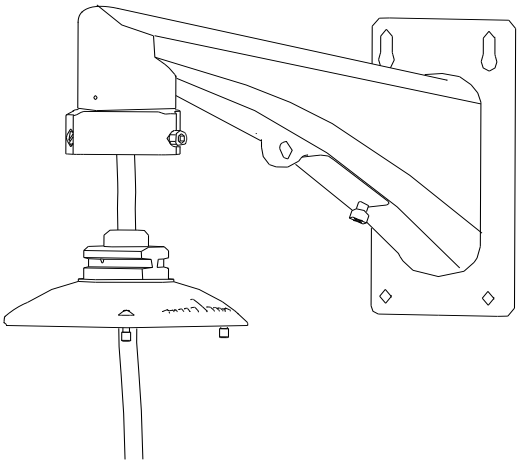


Figure1. 3 Install the Top Cover

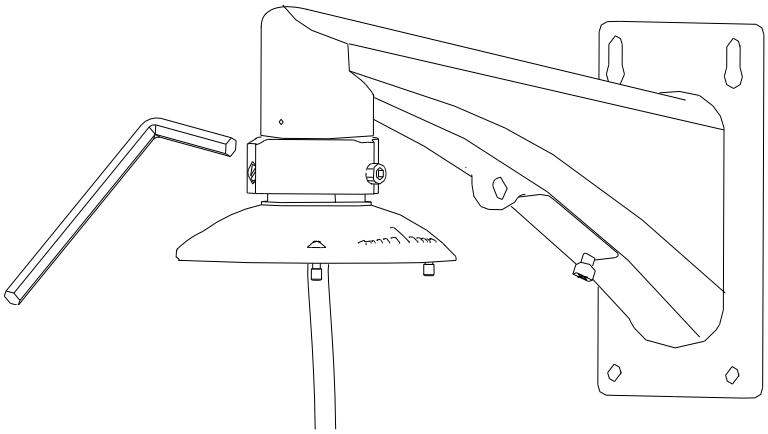
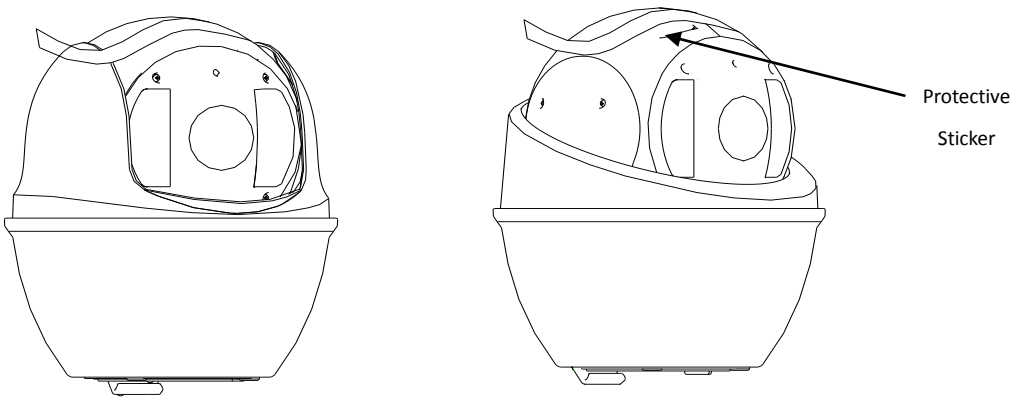


Figure1. 4 Fasten the Lock Screws

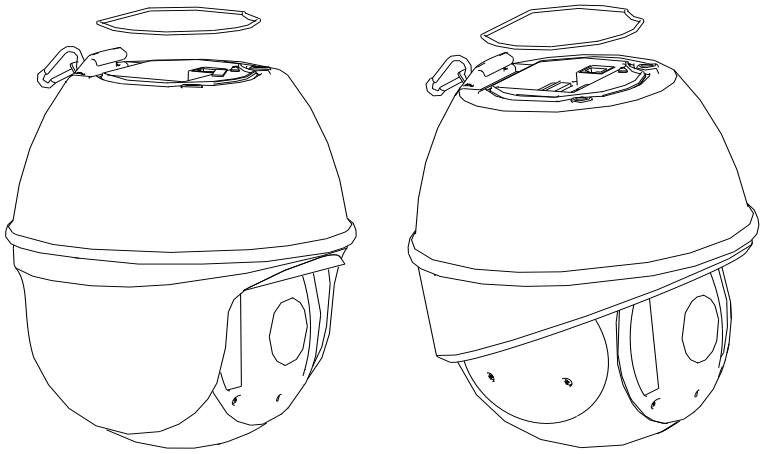
4. Tear off the protective sticker from the dome as shown in figure 1.2.5.



Network High-definition IR Speed Dome (Network) IR Speed Dome

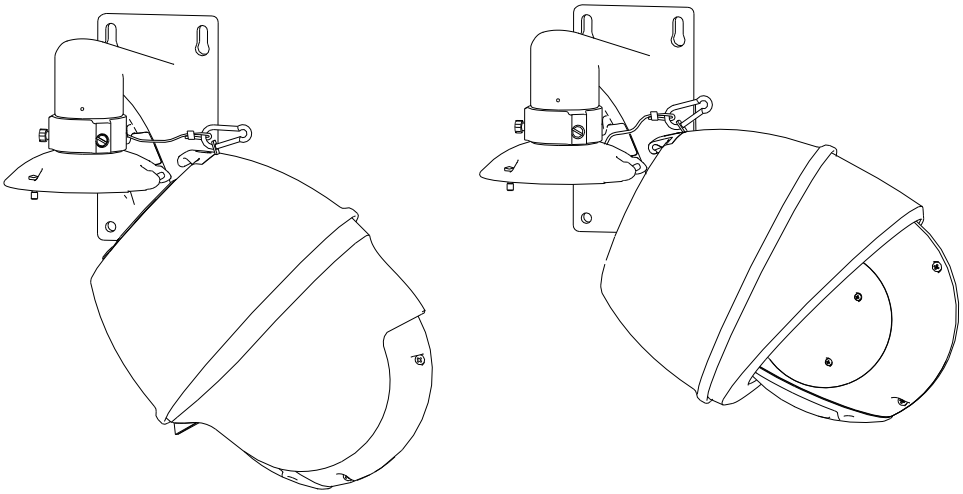
Figure1. 5 Tear off the Protective Stickers

5. Install the sealing loop or waterproofing and tie the safety lanyard to the dome.



Network High-definition IR Speed Dome (network) IR Speed Dome

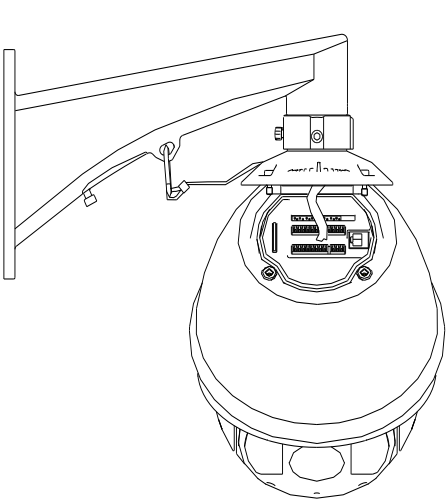
Figure1. 6 Install the Sealing Loop



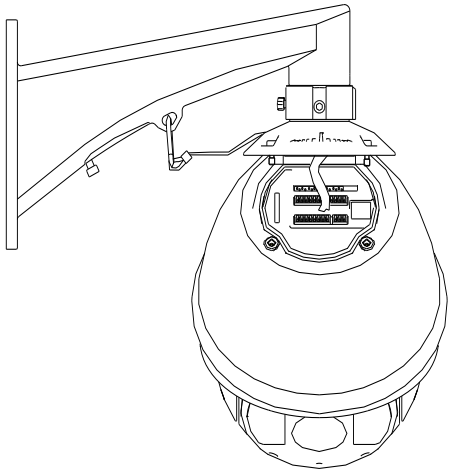
Network High-definition IR Speed Dome (Network) IR Speed Dome

Figure1. 7 Tie the safety lanyard

6. Hang the hanging hook on the dome bottom to the top cover. Pass the integrated cable through the mount and the top cover, and connect it into the corresponding slots on the bottom circuit board (For cabling, please refer to section 1.2 to see more details).



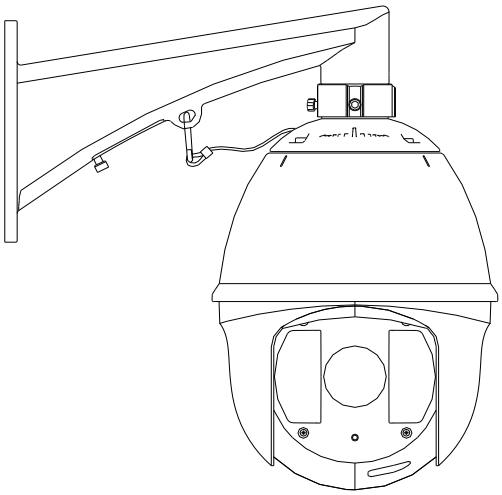
Network High-definition IR Speed Dome



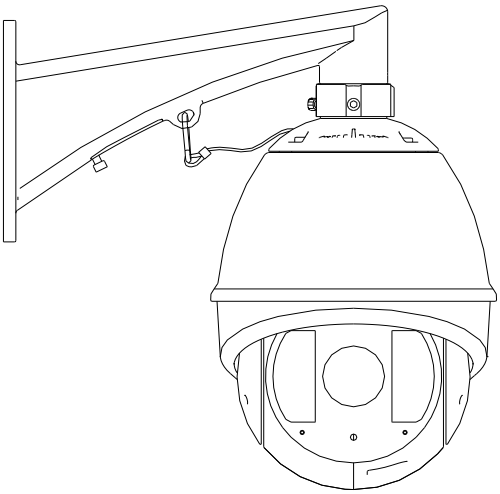
(network) IR Speed Dome

Figure1. 8 Hang the Dome to the Top Cover

7. Fasten the set screws to reinforce the mounting



Network High-definition IR Speed Dome



(Network) IR Speed Dome

Figure1. 9 Fix the IR Speed Dome

1.2 Cabling

Note: Please turn off the power before cabling.

1.2.1 Cable Standards

1. Video Cable

Please choose the video cables according to the transmission length. It should meet following requirements: 75Ω resistance; 100% copper core conducting wire; 95% weaving copper shield.

2. For RS485 communication cables, please refer to Appendix 2

3. For 24V AC power cables, please refer to Appendix 3

For AC power supply, the maximum transmission distance (L(m)) is limited by the bare cable's cross-sectional area(S (mm²)) of the dome.

For IR speed dome, L (m) = 50 * S; while for network IR speed domes, L (m) =40 * S.

For example, if the cross-sectional area of bare cable is 1mm ², the transmission distance of IR speed dome and network IR speed dome should not exceed 50m and 40m respectively.

1.2.2 Cabling Instructions

4. Internal cables

For analog cameras, all the internal cables have been connected to corresponding interfaces; for network cameras, network cable, power cable and video output cable have been connected.

5. External cables

To connect external cables to corresponding equipment, please refer to the cable labels as shown in Figure 1.10 and 1.11.

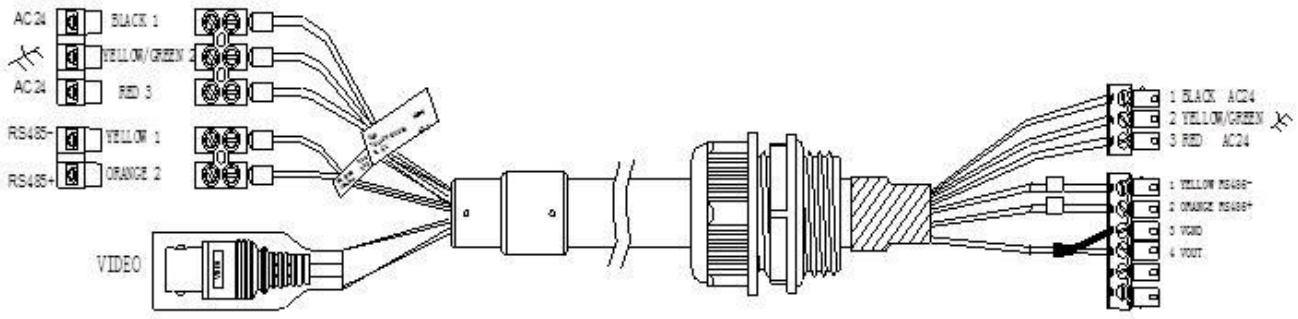


Figure1. 10 Analog Speed Dome Integrated Cables

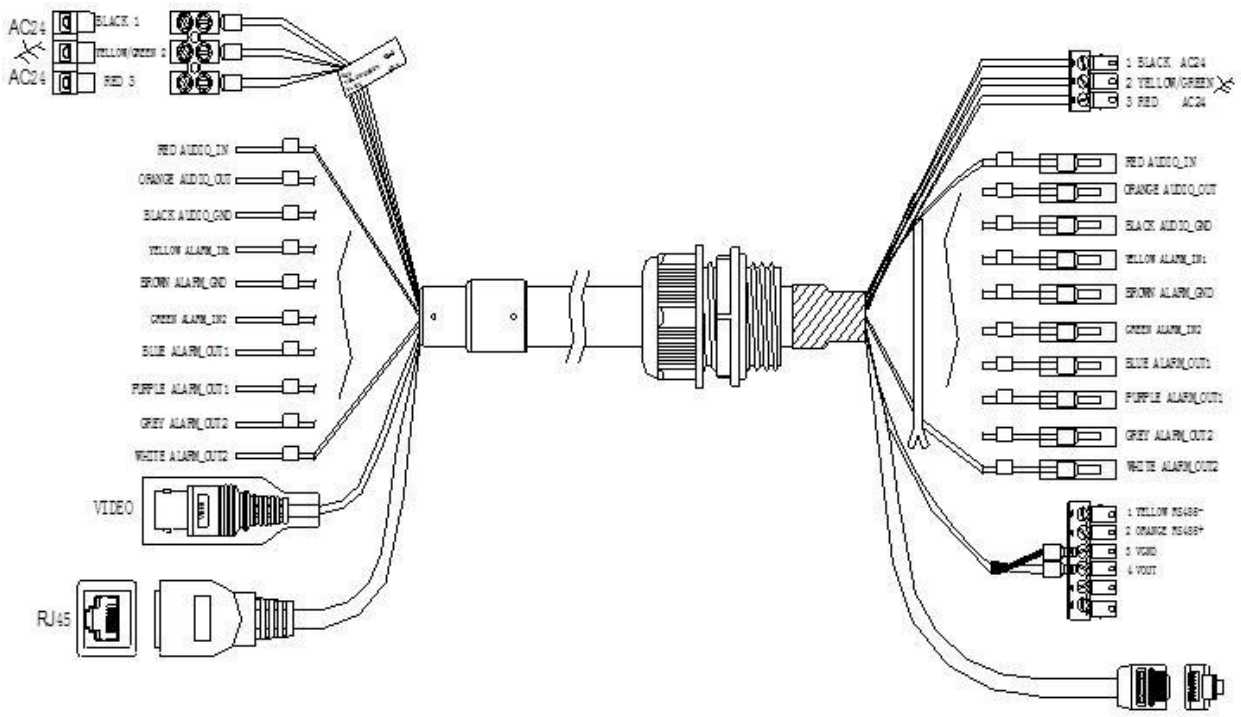


Figure1. 11 Network Speed Dome Integrated Cables

Take alarm input/output cabling for IR speed dome as an example:

Steps:

6. Open the head cover of the dome and find the alarm in/out terminals on the bottom circuit board as shown in Figure1.12.
7. Find the alarm input/output cables. You can distinguish the cables by color and labels (Eg. Audio output cable in orange with label “AUDIO_OUT”, please refer to Figure 1.10 and Figure 1.11 for more information)
8. Remove the protective covering from the cable plug.
9. Connect the cable to the corresponding slot on the circuit board and secure the cable with lock screws.
10. Connect the cables to the external alarm devices (See Figure 1.10 and Figure 1.11).

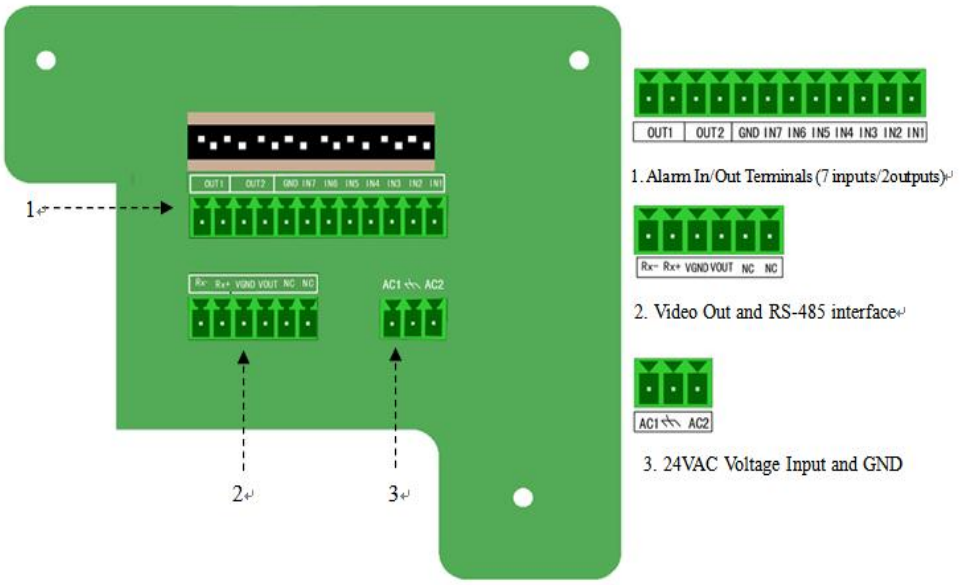

OUT1 OUT2 GND IN7 IN6 IN5 IN4 IN3 IN2 IN1
1. Alarm In/Out Terminals (7 inputs/2outputs)
Rx- Rx+ VGND VOUT NC NC
2. Video Out and RS-485 interface
AC1 AC2
3. 24VAC Voltage Input and GND
1
2
3

Figure1. 12 Bottom Circuit Board of IR Speed Dome

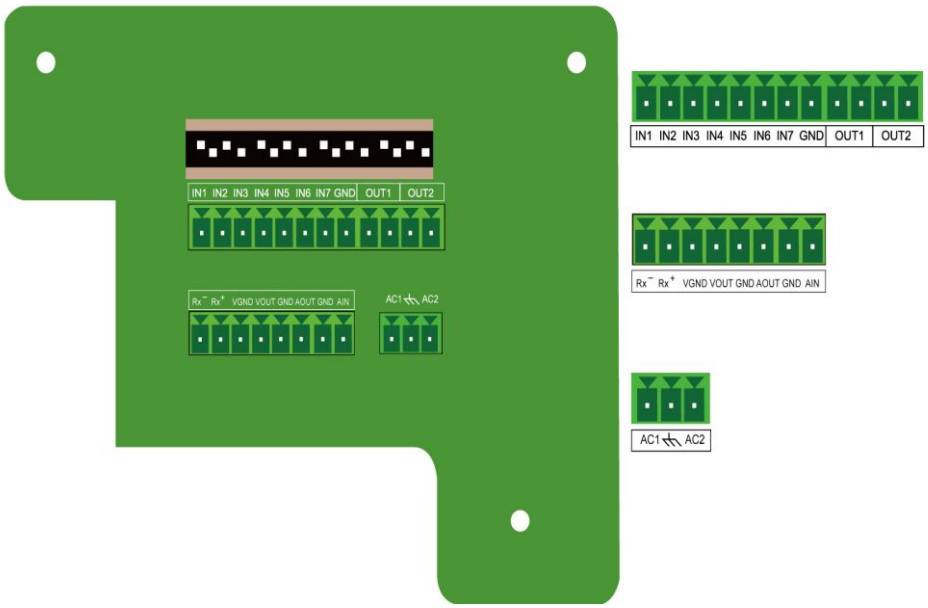


Figure1. 13 Bottom Circuit Board of Network IR Speed Dome

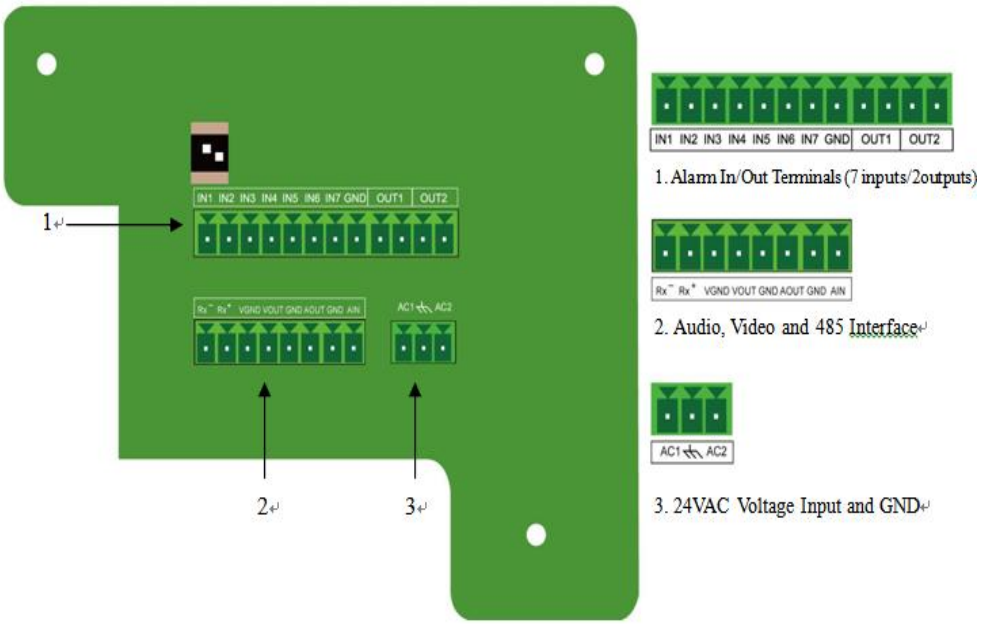

IN1 IN2 IN3 IN4 IN5 IN6 IN7 GND OUT1 OUT2
1
Rx- Rx+ VGND VOUT GND AOUT GND AIN
AC1 AC2
2
3
1. Alarm In/Out Terminals (7 inputs/2outputs)
2. Audio, Video and 485 Interface
3. 24VAC Voltage Input and GND

Figure1. 14 Bottom Circuit Board of Network High-definition IR Speed Dome)

1.2.3 Alarm Input /Output

Both the IR speed dome and network IR speed dome models support up to 7 alarm inputs (0~12VDC), 2 alarm outputs and relay output (no voltage).

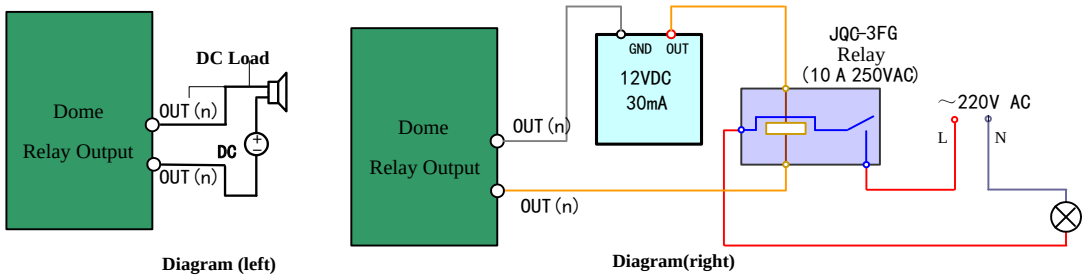


Figure1. 15 Alarm Connections

To connect external alarm devices, external power supply is required as below:

1. For DC power supply (refer to the left diagram of Figure 1.16), input voltage should be within 12VDC, 30mA.

2. For AC power supply (right diagram), an external relay is required to avoid any potential danger.

1.3 DIP Switch Settings

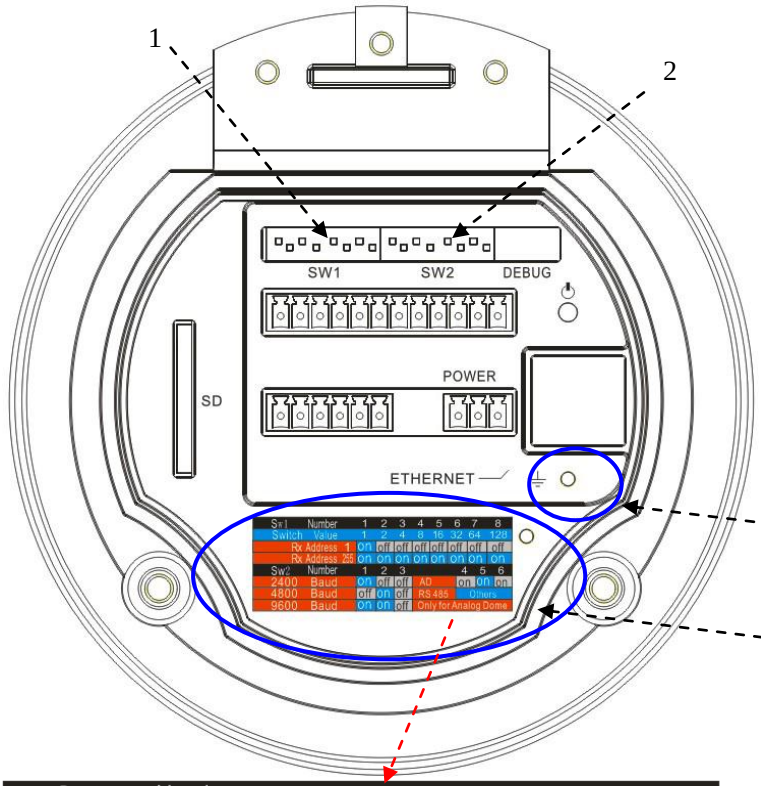
There are two DIP switches SW1 and SW2 for address, baud rate and protocol settings.

Note:

1. 485 serial port parameters of network high-definition IR speed dome should be configured in OSD menu. You can login to client software or open IE browser and navigate to “Remote Settings” to configure.
2. Default settings: Address code: 0;baud rate: 2400; 120Ω matched resistor: OFF

Before you start:

Please remove the grounding screw from the circuit board if electromagnetic interferences exist.



1. Address DIP Switch
2. Protocol DIP Switch
3. Address and Protocol Settings
4. Grounding screw

Sw1	Number	1	2	3	4	5	6	7	8
Switch	Value	1	2	4	8	16	32	64	128
Rx Address	1	on	off	off	off	off	off	off	off
Rx Address	255	on	on	on	on	on	on	on	on

Sw2	Number	1	2	3		4	5	6
2400	Baud	on	off	off	AD	on	on	on
4800	Baud	off	on	off	RS 485	Others		
9600	Baud	on	on	off	Only for Analog Dome			

Figure1. 16 Bottom Board of IR speed dome

1.3.1 Address Settings

There are 8 positions of switch SW1 for dome address settings. Set the position to “OFF” for value “0” and “ON” for value “1”.

Dome Address	SW1 Settings	1	2	3	4	5	6	7	8
0		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1		ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
255		ON	ON	ON	ON	ON	ON	ON	ON

Table 1.1 Address Settings

For addresses 0-71, please refer to Table 1.2:

Dome Address	DIP Switch SW1-Address Settings							
	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF

35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF

Table 1.2 Address Settings

1.3.2 Baud Rate Settings

Positions 1-3 of SW2 are for baud rate settings. Set “ON” state for each position for values “100”,”010” and “110”, representing 2400bps, 4800bps and 9600bps respectively. Please see below table of baud rate setting pattern.

Note: For rates out of this range, default value 2400bps will be saved alternatively.

DIP Switch SW2-Baud Rate Settings				
Baud Rate	Positions1-3 Settings	1	2	3
2400		ON	OFF	OFF
4800		OFF	ON	OFF
9600		ON	ON	OFF

Table 1.3 Baud Rate Settings

1.3.3 Protocol Settings

Positions 4-6 of SW2 are used for protocol settings. Please Refer to Table 1.4 for details.

DIP Switch SW2-Protocol Settings				
Protocol Type	Positions 4-6 Settings	4	5	6
Bosch Manchester		OFF	ON	ON
AD Manchester		ON	ON	ON
Self-adaptive	N/A			

Table 1.4 Protocol Settings

Note:

1. Network speed domes does not support Manchester code protocol.
2. IR speed dome is self-adaptive to PELCO-D, PELCO-P, HIK-Code, VICON and KALATEL-32 protocols, and network IR speed dome is self-adaptive to PELCO-P, PELCO-D and HIK-Code protocols. Protocol settings are not applicable for both.

1.3.4 Communication Type Settings

Position 7 of SW2 is used for communication type settings. There are two types of communications, simplex and half-duplex.

DIP Switch SW2-Communication Type Settings

Types	Position 7 Settings	7
Simplex		OFF
Half-duplex		ON

Table 1.5 Communication Type Settings

1.3.5 Terminal Resistor Connection Settings

Position 8 of SW2 is used for terminal matched resistor settings

DIP Switch SW2-Terminal Resistor Connection Settings		
State	Position 8 Setting	8
Not Connected		OFF
Connected		ON

Table 1.6 Matched Resistor Settings

Chapter 2 Mount Selection

2.1 Long Wall Mount

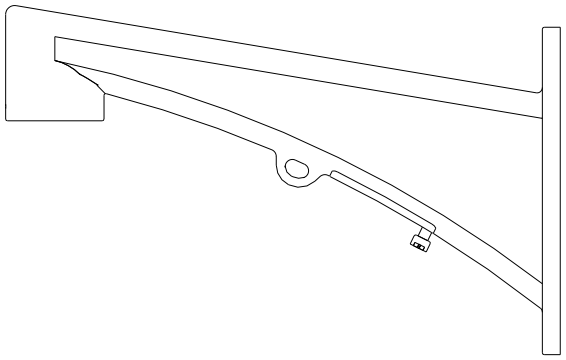


Figure2. 1 Long Wall Mount

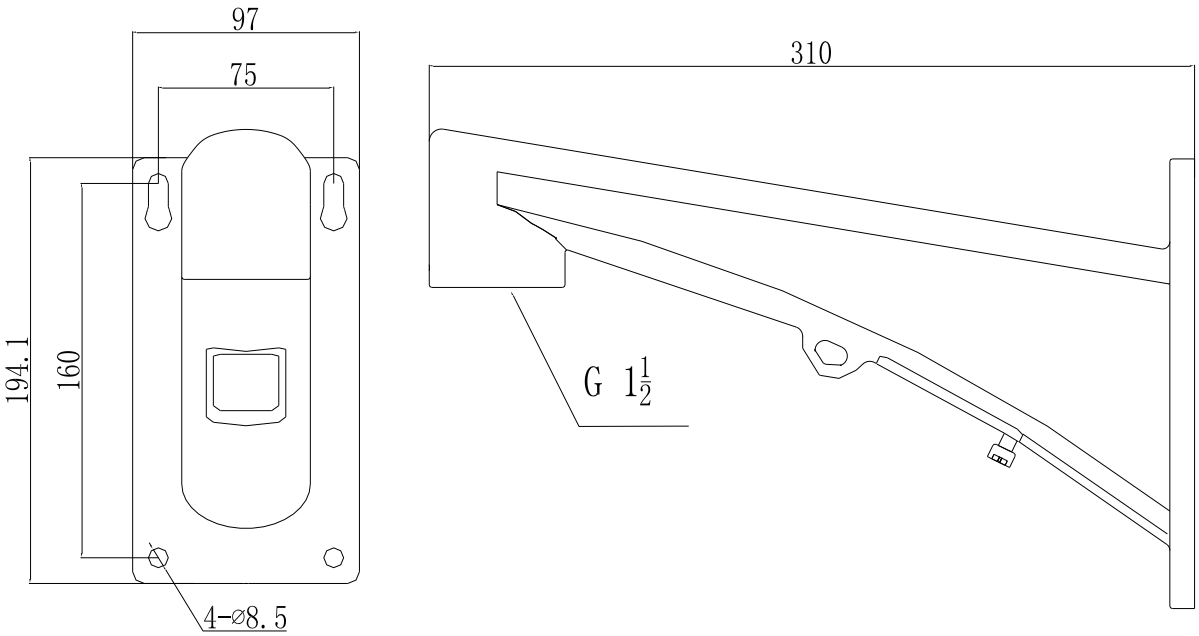


Figure2. 1 Long Wall Mount Dimensions

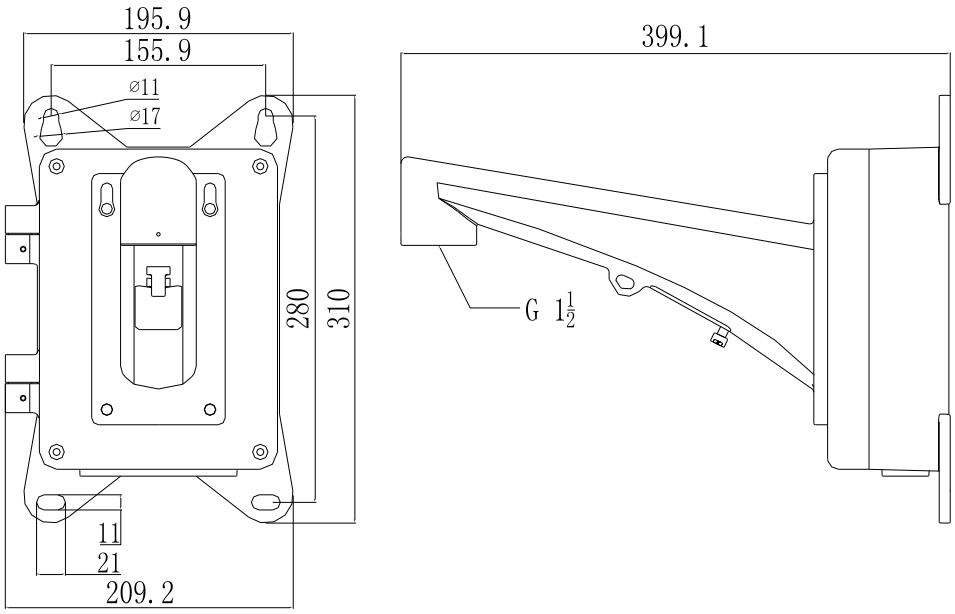


Figure2. 2 Wall Mount with Power Supply Box

2.2 Short Wall Mount

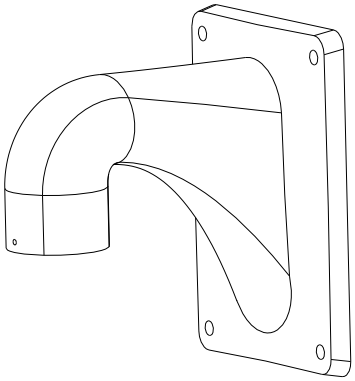


Figure2. 3 Short Wall Mount

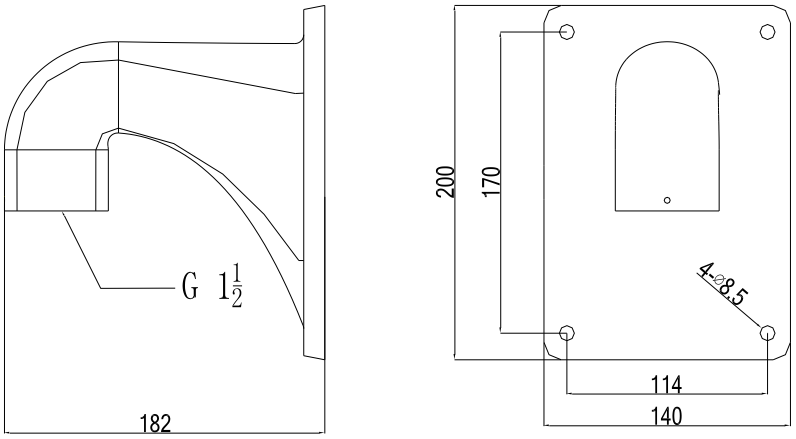


Figure2. 4 Short Wall Mount Dimensions

2.3 Corner Mount

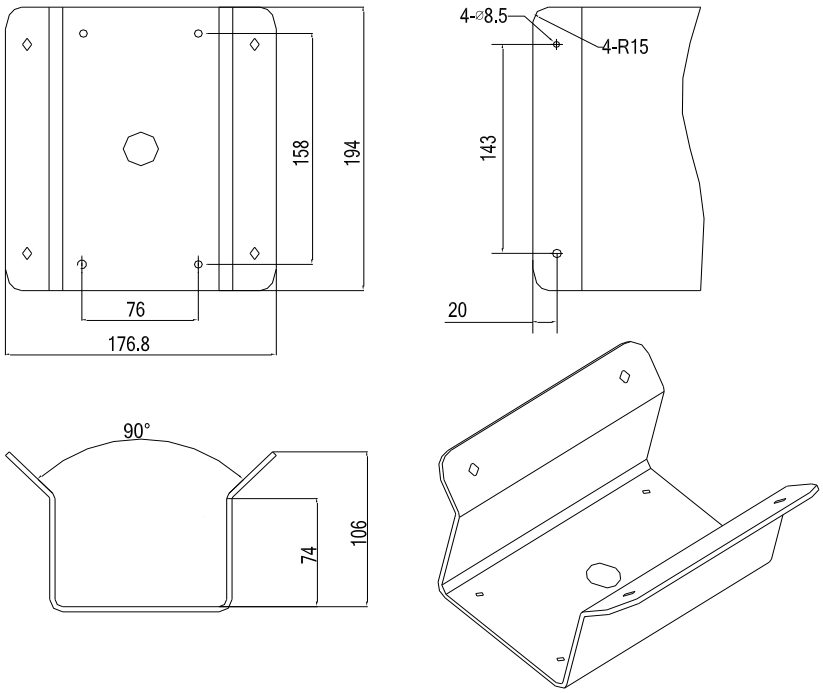


Figure2. 6 Corner Mount

2.4 Pole Mount

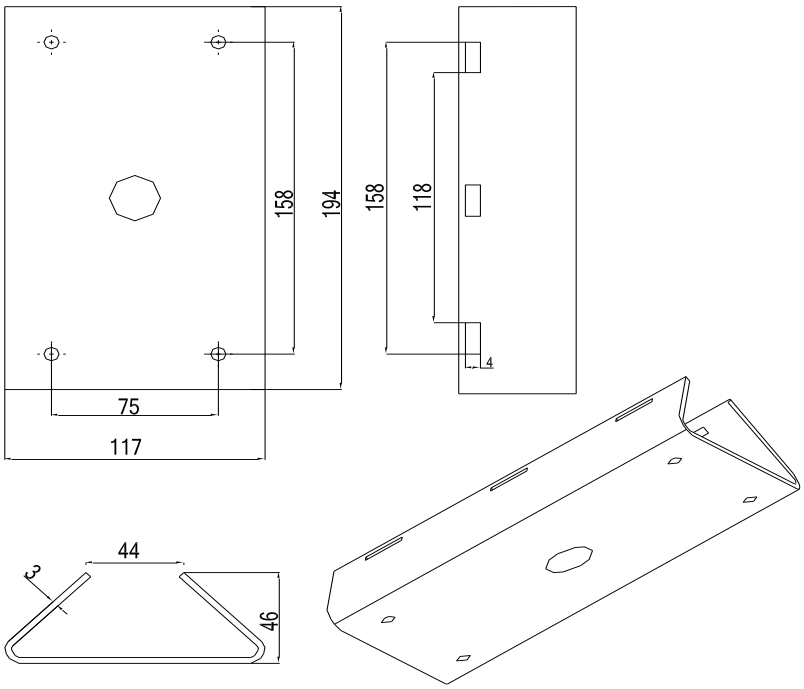


Figure2. 7 Pole Mount

Chapter 3 Mounting Instructions

Before you start:

For cement walls, expansion screws are needed for mounting (mounting in cement walls are taken as examples in blow sections). For wooden walls, you need to use self-tapping screws. Please make sure that the wall is sturdy enough to withstand more than 3 times the weight of the dome and the bracket. If not, the dome may fall and cause serious damage.

3.1 Wall Mounting

Notes:

1. Wall mounting is applicable to indoor/outdoor suspending domes. For outdoor applications, please adopt the water-proof components.
2. Long mount and mount with power supply box are taken as examples in this section.
3. Short mount is not recommended for outdoor applications

3.1.1 Components

1. Wall Mounts

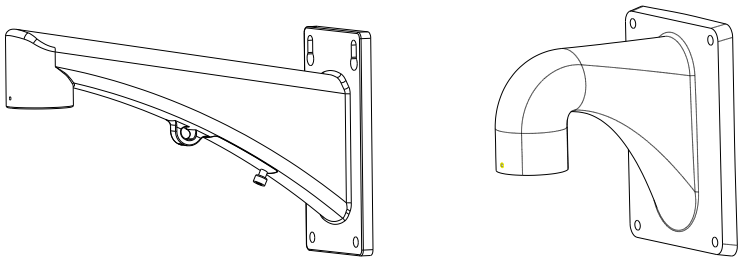


Figure3. 1 Wall Mounts

2. Mounting Accessories

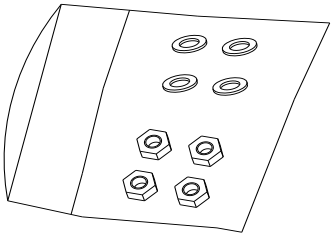


Figure3. 2 Nuts and Flat Washers

3.1.2 Mounting with a Long Mount

Steps:

1. Drill four holes in the wall, insert M6 expansion screws (not supplied) into the mounting holes.

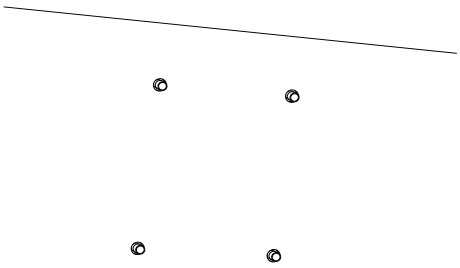


Figure3. 3 Drill the Holes in the Cement Wall

2. Screw hex nuts padded with flat washers through the wall mount and the rubber gaskets with the expansion screws to secure the mount.

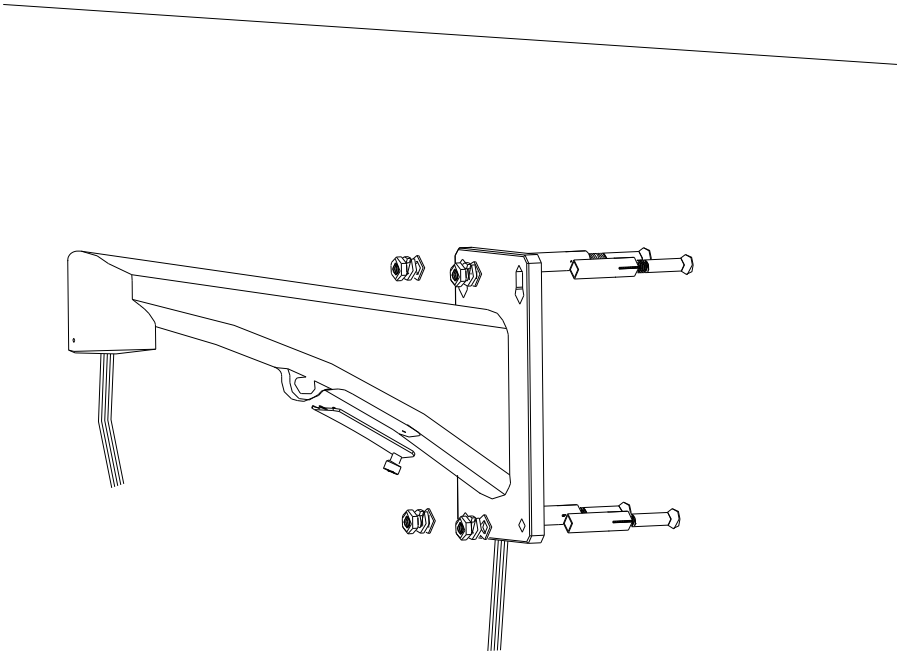


Figure3. 4 Secure the Mount

3. Install the dome to the mount

Please refer to Chapter 1 for dome installation.

3.1.3 Mounting with a Power Supply Box

Steps:

1. Drill four holes in the wall, insert M10 expansion screws (not supplied) into the mounting holes.
2. Secure the power supply box to the wall with nuts and washers. Tighten the four expansion screws.

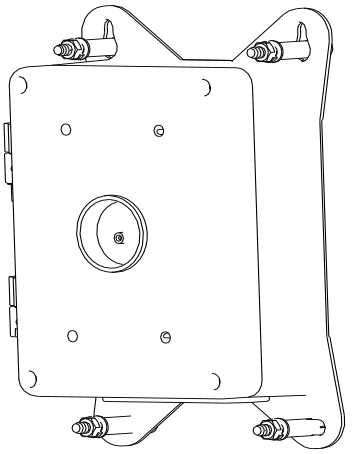


Figure3. 5 Install the Power Supply Box

3. Position the wall mount to the power supply box and tighten the screws.

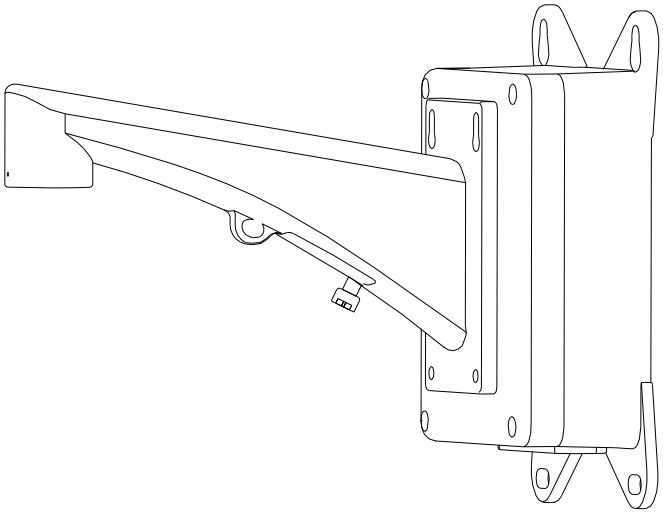


Figure3. 6 Install the Mount

4. Install the dome to the mount

Please refer to Chapter 1 for dome installation.

3.2 Corner Mounting

Note: Corner mounting is applicable to indoor/outdoor 90°corner constructions.

3.2.1 Components

1. Mounts

A corner mount has to be used together with a wall mount for corner mounting applications.

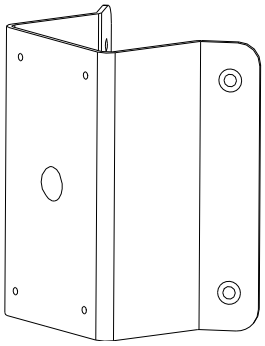


Figure3. 7 Corner Mount

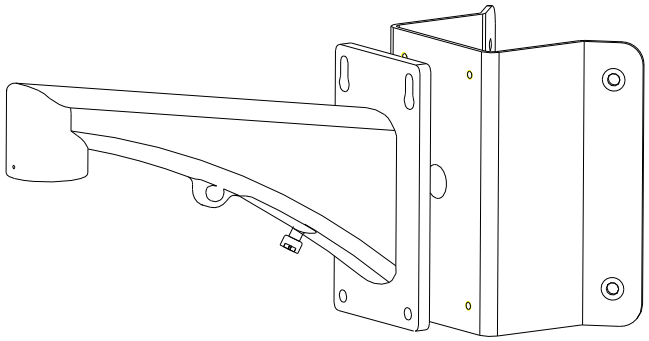


Figure3. 8 Corner Mount and Wall Mount

2. Mounting Accessories

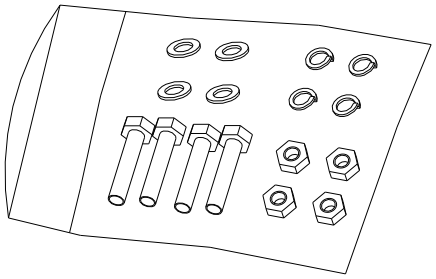


Figure3. 9 Hexagonal Screws (M8×30), Nuts, Spring Washers and Flat Washers

3.2.2 Corner Mounting Instructions

Steps:

1. Drill four holes in the corner, insert M6 expansion screws (not supplied) into the holes, and position the mount to the wall.

2. Pass the power cord, video cable and control line through the opening of the corner mount.

Note: Make sure the cables are long enough. For outdoor applications, you can use sealant to seal the cable openings for waterproofing.

3. Secure the mount to the corner by using nuts and washers. Tighten the expansion screws.

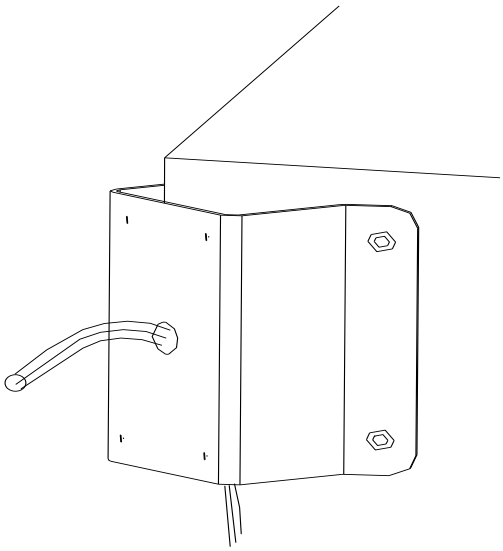


Figure3. 10 Install the Corner Mount

4. Position the wall mount, fasten the hexagonal screws with the spring washers through the wall mount and the gaskets, and tighten them with the corner mount.

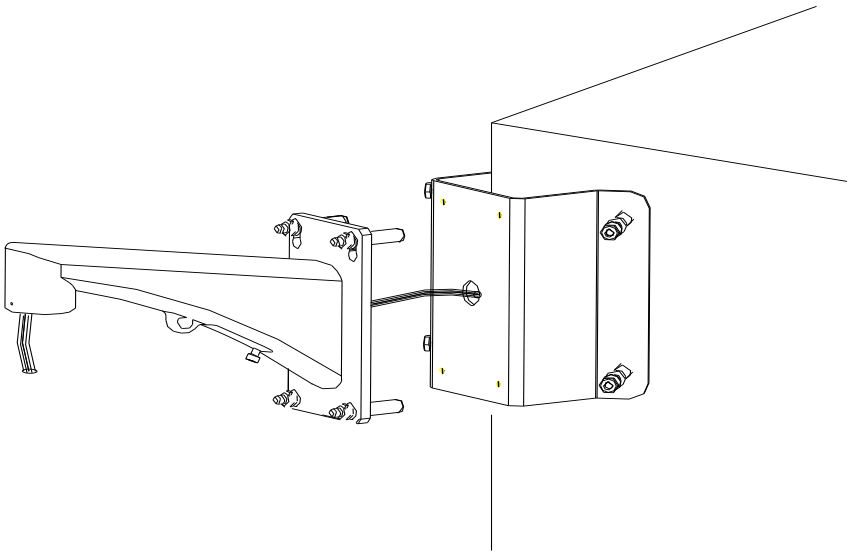


Figure3. 11 Install the Wall Mount

5. Install the dome to the mount

Please refer to Chapter 1 for dome installation.

3.3 Pole Mounting Applications

Note: Pole mounting is applicable to the indoor/outdoor pole constructions

3.3.1 Mounting Components

1. Mounts

A pole mount has to be used together with a wall mount for pole mounting applications.

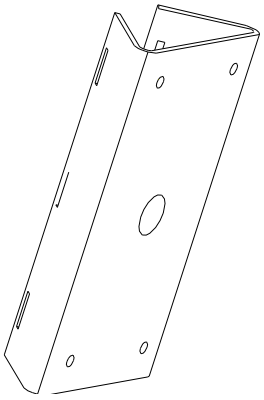


Figure3. 12 Pole Mount

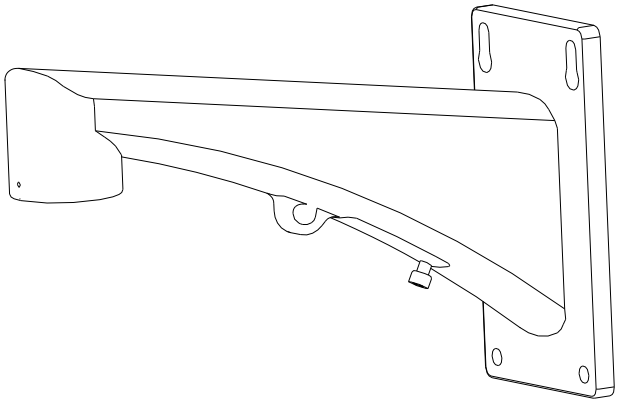


Figure3. 13 Wall Mount

2. Pole Mounting Hoop

Pole mounting hoop is used for pole mounting with pole mount and wall mount. There are following dimensions selectable: ϕ59-82mm, ϕ84-108mm, ϕ103-127mm, ϕ130-152mm, ϕ155-178mm, ϕ180-203mm and ϕ194-216mm. Dimensions can be customized according to users' demand.

Note: The dimensions of the pole mounting hoop must fit the diameter of the pole mount.

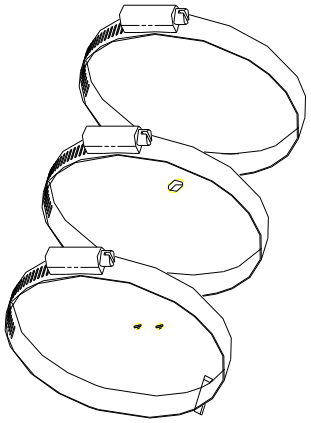


Figure3. 14 Pole Mounting Loops

3. Mounting Accessories

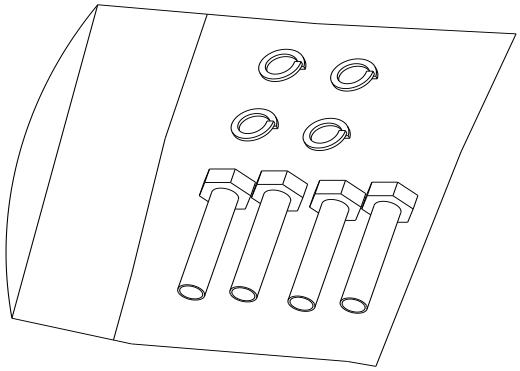


Figure3. 15 Hexagonal Screws (M8×30) and Spring Washers

3.3.2 Pole Mounting Instructions

Steps:

1. To assemble pole mount and pole mounting hoops, loosen the hoops with a screw driver and insert them through the holes of the mount.

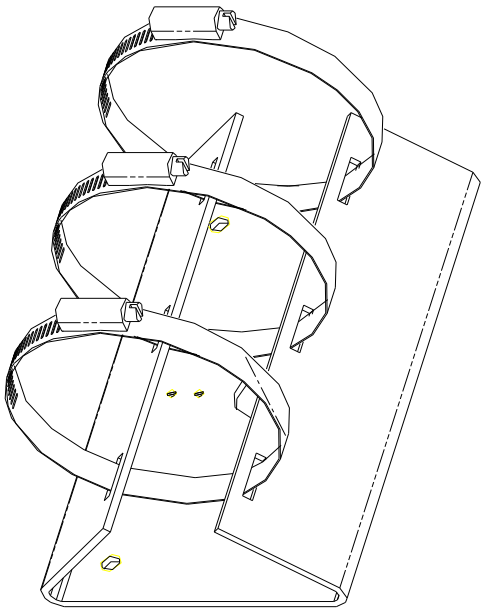


Figure3. 16 Assemble the Hoops and the Pole Mount

2. Pass the power cord, video cable and control line through the opening of the pole mount.

Note: Make sure the cables are long enough. For outdoor applications, you can use sealant to seal the cable openings for waterproofing.

3. Open the hoops and clip them to the pole. Close the hoops and fasten the screws tightly.

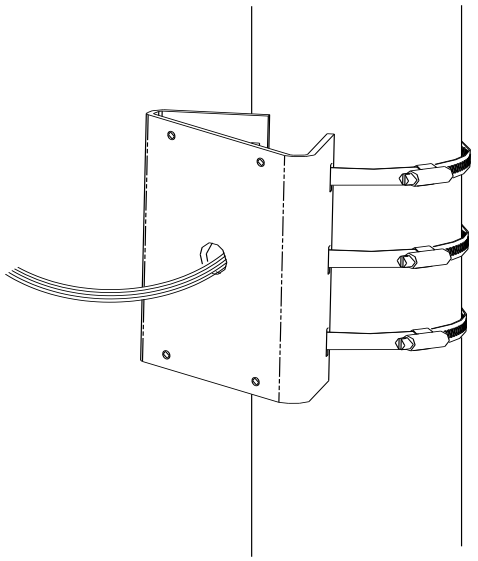


Figure3. 17 Install the Pole Mount

5. Position the wall mount, fasten the hexagonal screws with the spring washers through the wall mount and the gaskets, and tighten them with the pole mount.

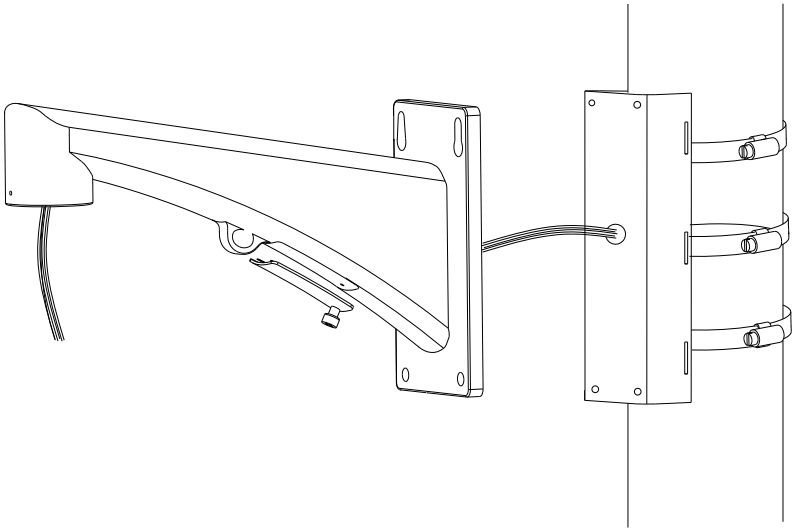


Figure3. 18 Install the Wall Mount

6. Install the dome to the mount

Please refer to Chapter 1 for dome installation.

Appendix 1 Lightning and Power Surge Protection

This product adopts TVS plate lightning protection technology to avoid damage caused by pulse signal that is below 3000W (Eg, Lightning , power surges and etc.) Necessary protections must be taken to secure the electrical safety outdoors.

1. The distance between signal transmission line and high-voltage equipment or high-voltage cable is at least 50m.
2. Outdoor wiring should be along the eaves.
3. In the open areas, wires should be buried underground in sealed steel pipes, and the steel pipes should be one-point grounded. Overhead routing is forbidden.
4. In strong thunderstorm situations or high induction voltage areas (such as areas of high-voltage transformers), high power lightning protection apparatus and lightning conductor are necessary.
5. The installation, wiring, lightning and grounding protection of this product should be part of the protection system of the building where this product is installed, and conform to the related national standards and industry standards.
6. Equipotential grounding should be applied for this product. The grounding equipment must meet anti-jamming and electric safety requirements, and it's not allowed to connect to the zero line of strong power grids. For individual grounding, the resistance should not exceed 4Ω, and the sectional area should not be less than 25 mm^2. For detailed grounding instructions, please refer to *Installation Manual of Speed Dome*.

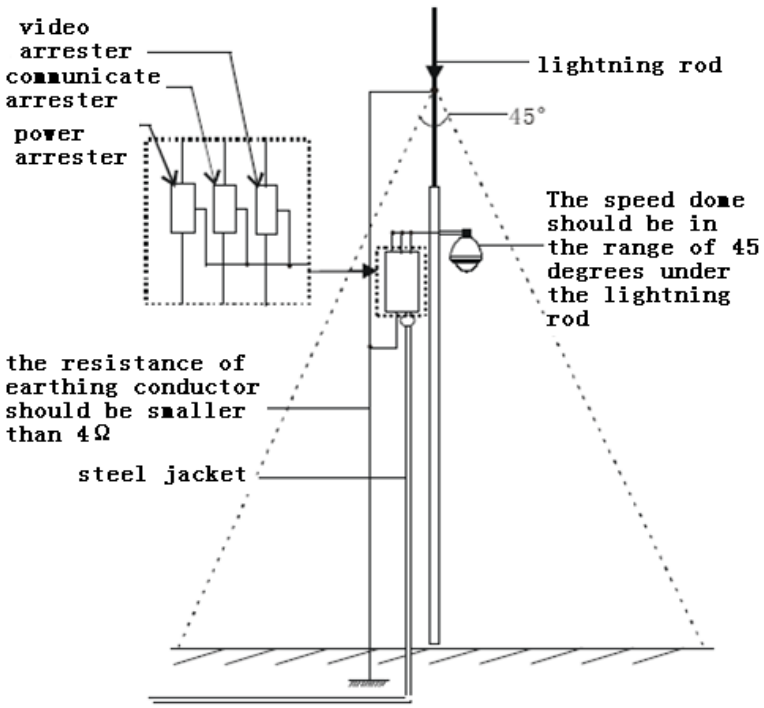


Figure4. 1 Lightning Protection and Grounding

Appendix 2 RS485 Bus Connection

1. RS485 Bus Properties

RS485 is a half-duplex communication bus which has 120Ω characteristic impedance, and its maximum load ability is 32 payloads (including controlling devices and controlled devices).

2. RS485 Bus Transmission Distance

Using 0.56mm (24AWG) twisted-pair line, the max transmission distances for different baud rates are shown as below:

Baud Rate	Max Distance
2400BPS	1800m
4800BPS	1200m
9600BPS	800m

Table 4.1 Matched Resistance Settings

The transmission distance may decrease if a thinner cable is used, or the device is under a strong electromagnetic interference, or a bus is shared by multiple devices; vice versa.

3. RS485 Bus Connections

According to the industry standard, daisy-chain connection can be adopted for RS485 bus connections, with a 120Ω terminal resistor connected to both ends (as shown in Diagram 1). A simplified connection can also be applied in the cases that distance “D” is within a limited range (as shown in diagram 2).

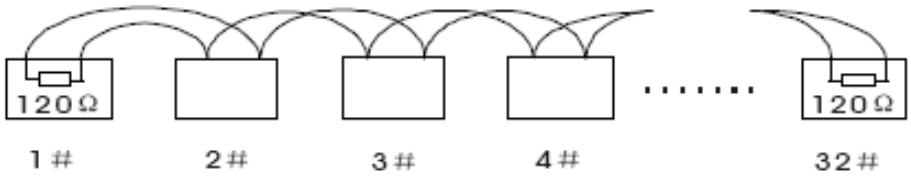


Figure4. 2 Daisy-chain Connection

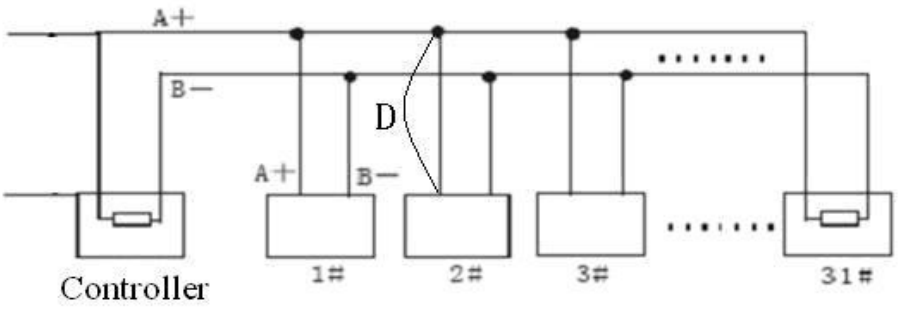


Figure4. 3 Simplified Connection

4. Terminal Resistor Connection

The 120Ω terminal resistors can be connected through the DIP switch on the circuit board and default as disconnected. To connect the resistor, simply switch on the eighth position of SW2. Please refer to section 1.3 for more about DIP switch settings.

5. RS485 Distributer Installation

In star-shaped construction (as shown in Figure4.4), terminal resistors are normally installed to the end devices with a long spacing distance (eg. In Figure 4.4, devices 1# and 15#). There will be problems such as signal reflection, anti-jamming ability decline and dome running out of control in this case.

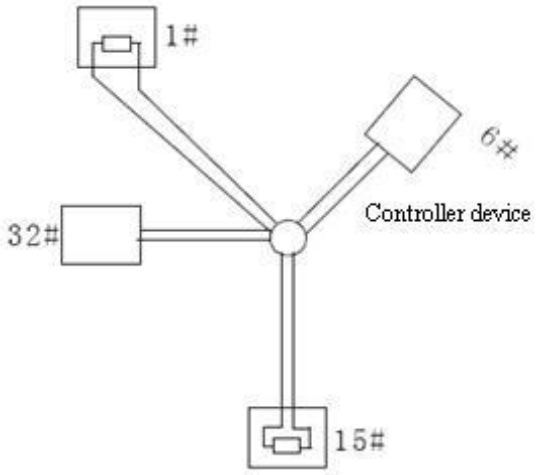


Figure4. 4 Star-shaped Connection

You can install a RS485 distributer which can effectively help to avoid those problems and improve communication reliability. Please see Figure4.5.

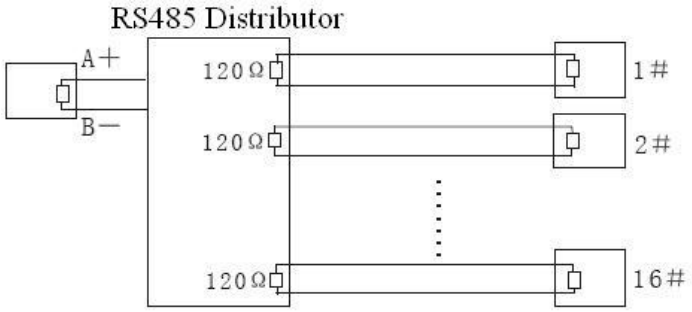


Figure4. 5 RS485 Distributer

Figure 5

6. FAQ about RS485 Bus

Fault Phenomenon	Probable Cause	Solutions
The speed dome do the self-check but can not be controlled.	1. The address or Baud Rate is not matched between Host and the Speed Dome.	1. Adjust the address or Baud Rate of Host or Speed Dome to make a match.
	2. RS485+,- are connected incorrectly.	2.Change the RS485+ and RS485- wires.
	3. Wiring drops,	3.fastening the wire
	4. RS485 wire broke;	4. Change RS485 wire.
The speed dome can be controlled but not smoothly	1. loose contact of RS485	1. fastening RS485 wire;
	2. one RS485 wire broke;	2. Change RS485 wire.
	3. Host and speed dome are too far away	3. Add terminal matched resistance
	4. Too many speed domes are connected	4. Add RS485 distributor

Table 4.2 RS485 Bus FAQs and Solutions

Appendix 3 Wire Gauge Standards

Bare Wire Gauge (mm)	American Wire Gage AWG	(British)Standard Wire Gauge SWG	Cross-sectional Area of Bare Wire mm
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35		0.01539
0.160	34	37	0.02011
0.180	33		0.02545
0.200	32	35	0.03142
0.230	31		0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25		0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15		1.7663
2.000	12	14	3.1420
2.500			4.9080.
3.00			7.0683

Table 4.3 Wire Gauge Standards